

MULTI-PURPOSE COWPEA INOCULATION FOR IMPROVED YIELDS IN SMALL HOLDER FARMS IN KENYA

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Introduction

In Kenya, cowpea is the most important pulse crop in the dry lands of Eastern and Coastal regions where it is commonly inter cropped with maize and sorghum.

The poor yields obtained in small holder farms in Kenya (150 kg ha⁻¹) can in part be attributed to the use of poor yielding varieties, low soil fertility (mainly N and P deficiency) low presence of effective indigenous rhizobia and high occurrence of highly competitive but inefficient indigenous rhizobia strains.

Biological nitrogen fixation (BNF) through exploitation of the rhizobia-legume symbiosis and use of inoculants coupled with soil amendments such as Phosphorus offers in part a means to improve cowpea yield, nutrition and soil fertility.

Objectives

- Identify competitive and effective rhizobial strains capable of providing sufficient nitrogen derived from BNF for cowpea cultivated in two different agro ecologies in Kenya.
- Identify optimal cowpea cultivar – rhizobial strain combinations to improve yield and protein content of cowpea production.
- Develop molecular markers for the evaluation and monitoring of rhizobial inoculations of improved strains.
- Develop efficient assay systems to determine the capacity of different cowpea genotypes for rhizobial symbiosis and BNF for large scale screening in breeding programs.

Methodology

Table 1: Characteristics of the proposed study sites.

Province	District	Altitude (m)	Average annual rainfall (mm)	Agro-ecological zone (AEZ)	Average annual temperature (°C)
Eastern	Mbeere	500-1200	640-1100	Lower midland	15-30
Coast	Kilifi	1-450	380-1230	Coastal lowland	22-34



Figure 1: Map showing proposed study sites in Kenya.

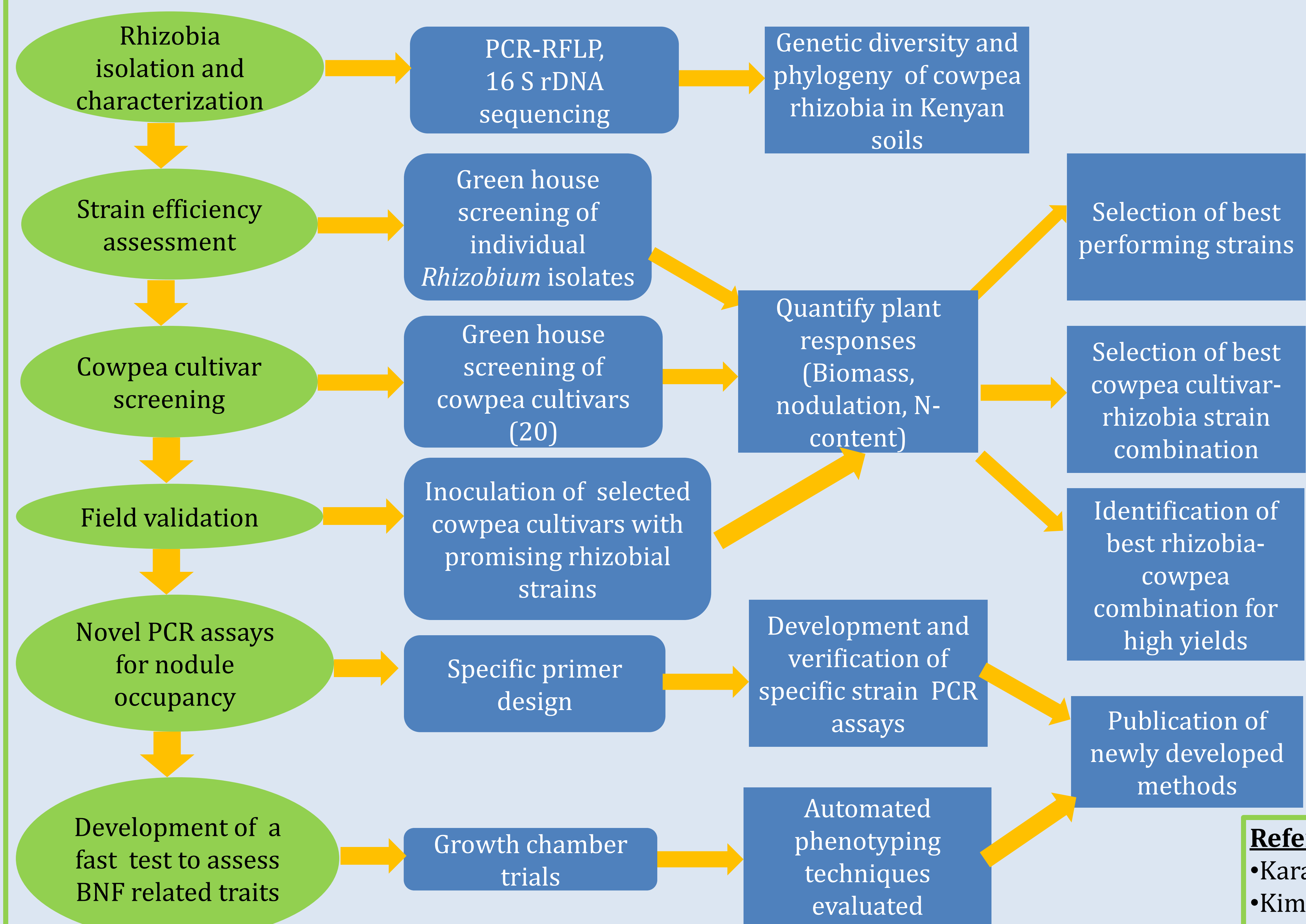


Figure 2: (a) Cowpea reproductive stage and (b) dried cowpea grains.

References

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Expected outputs

- Effective strains used for commercial inoculant production by a local company (MEA) are made available in the market at affordable cost for small holder farmers.
- High yielding cultivars disseminated to farmers by IITA and KARI (Kenyan Agricultural Research Institute).
- Adoption of higher yielding varieties and improved rhizobial inoculation resulting in more sustainable cowpea production under low input conditions in Kenya.
- PCR tests for monitoring rhizobial inoculations are available.
- Breeding tools for improved cowpea-rhizobial symbiosis.

Acknowledgements

This work has been funded by the Sawiri's scholarship program through the Swiss Federal Institute of Technology (ETH Zurich) in collaboration with the Research Institute for Organic Agriculture (FiBL) and the International Institute of Tropical Agriculture (IITA).